

<b>L Number</b>	<b>Hits</b>	<b>Search Text</b>	<b>DB</b>	<b>Time stamp</b>
<b>1</b>	<b>1</b>	<b>paper adj width adj (sensor detector) same edge same center</b>	<b>USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB</b>	<b>2004/10/29 12:18</b>
<b>2</b>	<b>1</b>	<b>paper adj edge adj (sensor detector) same edge same center</b>	<b>USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB</b>	<b>2004/10/29 12:19</b>
<b>3</b>	<b>2</b>	<b>medium adj edge adj (sensor detector) same edge same center</b>	<b>USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB</b>	<b>2004/10/29 12:33</b>
<b>4</b>	<b>29</b>	<b>(medium paper substrate) adj edge adj (sensor detector) and edge same center</b>	<b>USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB</b>	<b>2004/10/29 13:09</b>
<b>5</b>	<b>87</b>	<b>printer and edge adj (detect\$3 sensor) same candidate</b>	<b>USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB</b>	<b>2004/10/29 13:11</b>
<b>6</b>	<b>13</b>	<b>printer and edge adj (detect\$3 sensor) same candidate adj edge</b>	<b>USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB</b>	<b>2004/10/29 13:17</b>
<b>7</b>	<b>7</b>	<b>(printer and edge adj (detect\$3 sensor) same candidate adj edge) and edge same center</b>	<b>USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB</b>	<b>2004/10/29 13:18</b>

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DISCLOSURE TEXT:

5p. Disclosed in this article is apparatus by which an all-points-addressable printer may be controlled by the user so that he may design and/or type his own special characters or graphics, including letterheads, etc. It is assumed that the printer is interactive and that the matrix printhead 18 includes a scanner or the like mounted on the carrier for movement across print media 1 mounted on a platen 12. With the apparatus described hereinafter, the user is given freedom to generate his own set of custom graphics.

- In a conventional impact typewriter, each character is printed when a type face with a desired character embossed on the surface thereof is pressed against a ribbon onto the paper, leaving ink in the shape of the embossed area. Conventionally, the characters that may be printed are fixed in number and kind even when the type elements that are used on the typewriter are changeable. Moreover, special characters are limited to a size approximately equal to one character space. In order to obtain special characters, users must request that a special engineering design of the desired character be built into a special element. This process is expensive and time consuming.

Described below is a means by which the customer can easily design his own characters and program those characters into a matrix printing interactive printer, for example, an electronic typewriter without the need for external help or special equipment.

- The apparatus for accomplishing the same is illustrated best in the drawing. A preprinted form 1 contains a reference bar A and a grid B. Each grid element C corresponds to its particular spot in the

character box or character matrix of the matrix printhead.  
Inasmuch  
as the interactive **printer** to which the subject matter may  
be applied  
may also be used to draw forms or the like, the form or grid  
structure itself may be printed by the **printer** when required.  
- The scanner 2 in the drawing is capable of detecting  
black and  
white areas on the preprinted form 1, and sending  
appropriate signals  
to the signal processing and control electronics (SPCE) 3.  
The  
carrier 4 moves laterally across the print media or  
preprinted form 1  
as is conventional except that the carrier drive 5 is capable  
of  
moving the carrier at a steady velocity across the paper as  
well as  
moving incrementally when, for example, the **printer** is in  
the  
interactive mode for typing, for example, individual  
characters. As  
illustrated, the carrier drive comprises a drive motor 6, a  
lead  
screw 7, and an anti-backlash nut 8, an emitter wheel and  
**sensor** 9,  
signal processing electronics 10 and motor drive control  
electronics  
11.  
The emitter wheel and **sensor** 9 provide signals which are  
used to  
control the drive motor and to provide information on  
changes in the

horizontal position of the carrier 4 to the SPCE 3.

- The typewriter platen 12 is driven by the index drive mechanism

13 which includes a second emitter wheel and sensor 14, an index

drive motor 15, motor drive and control electronics 16 and signal

processing electronics 17. These are combined in a conventional

fashion so that on each command from the SPCE 3, the platen 12 causes

the paper to move up by an amount determined by the SPCE 3, for

example, 1/96, 1/8 or 1/6 inch. Further, the output of the signal

processing electronics 17 may be fed to the SPCE 3 so that information on exact indexing of the platen may be determined by the

SPCE 3.

- The matrix printhead 18 prints characters, numbers, etc., by

forming the printed image from a matrix of spots. The spots may be

generated by any appropriate technology, such as drop-on-demand ink

jet, synchronous ink jet as is used in the IBM 6640, a laser xerographic technology such as is employed in the IBM 6670, or even

with an impact printer suitably designed to print spots in the appropriate matrix position. Of course, this does not preclude other

matrix printer technology that permits the addressing of a particular

point on a print media.

- The system is preferably designed so that a predetermined relationship exists between the various parts. The platen 12 and the index drive 13 and the length of the side of the grid area C are

so designed that the index distance can be made equal to the length of the side of grid square C, for example, both equal to 1/8 inch.

Further, the index mechanism is designed so that it may index a

distance much smaller than the length of a side of a grid square, for

example, 1/96 inch. The side of the reference bar A is made some

fixed and known distance, for example, equal to the side of a grid

square. The bar may be spaced above the grid also by some fixed and

known distance, for example, equal to the side of a grid square.

The resolution of the information from the emitter wheel 9 and the signal processing hardware 10 about the horizontal position of the carrier

and bar code scanner is much finer than the length of the side of a

grid square C. It is also simpler if this resolution is a sub-multiple of the length of the side of the grid square, for example, 1/240 inch.

- In the drawing, the grid matrix along dimension E contains a number of grid squares equal to the number of spots in the vertical dimension of the character matrix printed by the matrix printhead 18 (for example, 40). The grid spacing on the preprinted form in dimension D is the same as the grid spacing along dimension E. The spacing of spots in a horizontal direction of the **printer** matrix under these circumstances should be the same as that in the vertical direction. Thus each square and grid of the preprinted form 1 corresponds uniquely to a spot that may be printed by the **printer**. Since the **printer** prints continuously in a horizontal direction, the form 1 may be extended in the D dimension to any desired and practical length up to the length of the print line. In the sample form shown, the length of the dimension E may, for example, be equal to 3/10 inch if a **printer** resolution of 240 pels/inch is employed. The grid elements do not have to be square, but it is preferable that the grid elements have the same proportions as the spots printed by the **printer** so that the figure printed has the same

proportion as the

one drawn on the preprinted form.

- The spot matrix storage electronics 20 may be a random-access memory such that as the head scans the preprinted form with a particular character or symbol thereon, such as the cross or large X which is the user-drawn figure on the preprinted form 1 shown on the platen 12, a one may be stored for the darkened grid areas and a zero for the undarkened grid areas.

- In operation, the user will darken each square on the preprinted form where a spot is required in order to produce the desired configuration when printed.

- The preprinted form with the desired grid areas darkened is then inserted squarely into the machine with the orientation shown in the figure. When the form is loaded, the SPCE 3 moves the carrier to the left to detect the left edge of the form, and then to the right to detect the right edge. Initially, the reference bar is set below the reading line of the scanner 2. The operator may then initiate the reading of the form by appropriate manipulation of the operator interface (keyboard or the like) 21.

- The SPCE 3 activates the index drive 13 until the



scanner 2

detects the reference bar A. Indexing continues until the reference

bars center vertically under the scanner 2. The SPCE 3 now has

sufficient information to move the scanner over each row of squares

in the grid of the preprinted form and to know which square the

scanner 2 is reading.

- The scanner 2 determines whether each square has been darkened

or not, and the SpCE 3 stores the appropriate logic level in the spot

matrix storage electronics or random-access memory 20. The bit

representation stored in the random-access memory 20 may be given a

label or name as specified by the operator through the operator

interface 21. To play back or print the symbol, the operator keys

the name or label together with appropriate control operations, and

the printer prints the stored pattern. If the grid is truly proportional to the character grid electronics, the graphics or

character, etc., will be reproduced in a reduced form. For example

with the dimensions heretofore given, and assuming the 240 pel/inch

matrix, a reduction of approximately 30:1 between the form the user

fills in and the actual printed output will occur.

- If the resulting figure is not as the user desires, he may modify the figure on the preprinted form and repeat the process until the desired result is achieved.

- Once the desired figure is achieved, a representation of the figure, character or graphics may be stored on any available medium, such as bar code on the paper or magnetic media, etc. The figure then may be more quickly read into the spot matrix storage electronics the next time it is to be employed.

- Alternatively, and if desired, an X or other character may be stored for every darkened pel on the input form and a blank or period may be stored for every undarkened pel so that the information gleaned from the scanning operation may be processed in text storage.

Such characters would appear as normal text to the machine and be capable of playback as printable information, while storing the information in the spot matrix storage electronics 20.

- This modification allows the operator to print out the text representative of the symbol, character, figure, etc., such as the X or cross in the figure. The operator may then easily identify, using the text presentation, what parts of the scanned graphics, if

any,

require editing. Thus normal text editing may be employed by causing

the storage of the darkened areas to be in a normal text editor-type

representation. Moreover, the symbol, graphics or the like may be

stored or reprinted at any time for more editing or modification.

- Thus the illustrated apparatus gives the user the ability to

custom design his own characters, figures or logos without requiring

any special or custom apparatus other than that described. Moreover,

one figure may extend over several character spaces.

Additionally,

the user may observe the results of his efforts immediately, making

modification and remodification easier.

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Disclosure Text - TBTX (1):

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limited to a size approximately equal to one character space. In order to obtain special characters, users must request that a special engineering design of the desired character be built into a special element. This process is expensive and time consuming. Described below is a means by which the customer can easily design his own characters and program those characters into a matrix printing interactive printer, for example, an electronic typewriter without the need for external help or special equipment. - The apparatus for accomplishing the same is illustrated best in the drawing. A preprinted form 1 contains a reference bar A and a grid B. Each grid element C corresponds to its particular spot in the character box or character matrix of the matrix printhead. Inasmuch as the interactive printer to which the subject matter may be applied may also be used to draw forms or the like, the form or grid structure itself may be printed by the printer when required. - The scanner 2 in the drawing is capable of detecting black and white areas on the preprinted form 1, and sending appropriate signals to the signal processing and control electronics (SPCE) 3. The carrier 4 moves laterally across the print media or

preprinted form 1 as is conventional except that the carrier drive 5 is capable of moving the carrier at a steady velocity across the paper as well as moving incrementally when, for example, the printer is in the interactive mode for typing, for example, individual characters. As illustrated, the carrier drive comprises a drive motor 6, a lead screw 7, and an anti-backlash nut 8, an emitter wheel and sensor 9, signal processing electronics 10 and motor drive control electronics 11. The emitter wheel and sensor 9 provide signals which are used to control the drive motor and to provide information on changes in the horizontal position of the carrier 4 to the SPCE 3. - The typewriter platen 12 is driven by the index drive mechanism 13 which includes a second emitter wheel and sensor 14, an index drive motor 15, motor drive and control electronics 16 and signal processing electronics 17. These are combined in a conventional fashion so that on each command from the SPCE 3, the platen 12 causes the paper to move up by an amount determined by the SPCE 3, for example, 1/96, 1/8 or 1/6 inch. Further, the output of the signal processing electronics 17 may be fed to the SPCE 3 so that information on exact indexing of the platen may be determined by the SPCE

3. - The matrix printhead 18 prints characters, numbers, etc., by forming the printed image from a matrix of spots. The spots may be generated by any appropriate technology, such as drop-on-demand ink jet, synchronous ink jet as is used in the IBM 6640, a laser xerographic technology such as is employed in the IBM 6670, or even with an impact printer suitably designed to print spots in the appropriate matrix position. Of course, this does not preclude other printer technology that permits the addressing of a particular point on a print media. - The system is preferably designed so that a predetermined relationship exists between the various parts. The platen 12 and the index drive 13 and the length of the side of the grid area C are so designed that the index distance can be made equal to the length of the side of grid square C, for example, both equal to 1/8 inch. Further, the index mechanism is designed so that it may index a distance much smaller than the length of a side of a grid square, for example, 1/96 inch. The side of the reference bar A is made some fixed and known distance, for example, equal to the side of a grid square. The bar may be spaced above the grid also by some fixed and

known distance, for example, equal to the side of a grid square. The resolution of the information from the emitter wheel 9 and the signal processing hardware 10 about the horizontal position of the carrier and bar code scanner is much finer than the length of the side of a grid square C. It is also simpler if this resolution is a sub-multiple of the length of the side of the grid square, for example, 1/240 inch. - In the drawing, the grid matrix along dimension E contains a number of grid squares equal to the number of spots in the vertical dimension of the character matrix printed by the matrix printhead 18 (for example, 40). The grid spacing on the preprinted form in dimension D is the same as the grid spacing along dimension E. The spacing of spots in a horizontal direction of the printer matrix under these circumstances should be the same as that in the vertical direction. Thus each square and grid of the preprinted form 1 corresponds uniquely to a spot that may be printed by the printer. Since the printer prints continuously in a horizontal direction, the form 1 may be extended in the D dimension to any desired and practical length up to the length of the print line. In the sample form shown, the length of the dimension E may, for



example, be equal to 3/10 inch if a printer resolution of 240 pels/inch is employed. The grid elements do not have to be square, but it is preferable that the grid elements have the same proportions as the spots printed by the printer so that the figure printed has the same proportion as the one drawn on the preprinted form. - The spot matrix storage electronics 20 may be a random-access memory such that as the head scans the preprinted form with a particular character or symbol thereon, such as the cross or large X which is the user-drawn figure on the preprinted form 1 shown on the platen 12, a one may be stored for the darkened grid areas and a zero for the undarkened grid areas. - In operation, the user will darken each square on the preprinted form where a spot is required in order to produce the desired configuration when printed. - The preprinted form with the desired grid areas darkened is then inserted squarely into the machine with the orientation shown in the figure. When the form is loaded, the SPCE 3 moves the carrier to the left to detect the left edge of the form, and then to the right to detect the right edge. Initially, the reference bar is set below the reading line of the scanner 2. The operator

may then initiate the reading of the form by appropriate manipulation of the operator interface (keyboard or the like) 21. - The SPCE 3 activates the index drive 13 until the scanner 2 detects the reference bar A. Indexing continues until the reference bars center vertically under the scanner 2. The SPCE 3 now has sufficient information to move the scanner over each row of squares in the grid of the preprinted form and to know which square the scanner 2 is reading. - The scanner 2 determines whether each square has been darkened or not, and the SpCE 3 stores the appropriate logic level in the spot matrix storage electronics or random-access memory 20. The bit representation stored in the random-access memory 20 may be given a label or name as specified by the operator through the operator interface 21. To play back or print the symbol, the operator keys the name or label together with appropriate control operations, and the printer prints the stored pattern. If the grid is truly proportional to the character grid electronics, the graphics or character, etc., will be reproduced in a reduced form. For example with the dimensions heretofore given, and assuming the 240 pel/inch matrix, a reduction of approximately 30:1 between the form the user

fills in and the actual printed output will occur. - If the resulting figure is not as the user desires, he may modify the figure on the preprinted form and repeat the process until the desired result is achieved. - Once the desired figure is achieved, a representation of the figure, character or graphics may be stored on any available medium, such as bar code on the paper or magnetic media, etc. The figure then may be more quickly read into the spot matrix storage electronics the next time it is to be employed. - Alternatively, and if desired, an X or other character may be stored for every darkened pel on the input form and a blank or period may be stored for every undarkened pel so that the information gleaned from the scanning operation may be processed in text storage. Such characters would appear as normal text to the machine and be capable of playback as printable information, while storing the information in the spot matrix storage electronics 20. - This modification allows the operator to print out the text representative of the symbol, character, figure, etc., such as the X or cross in the figure. The operator may then easily identify, using the text presentation, what parts of the

scanned graphics, if any, require editing. Thus normal text editing may be employed by causing the storage of the darkened areas to be in a normal text editor-type representation. Moreover, the symbol, graphics or the like may be stored or reprinted at any time for more editing or modification.

- Thus the illustrated apparatus gives the user the ability to custom design his own characters, figures or logos without requiring any special or custom apparatus other than that described. Moreover, one figure may extend over several character spaces. Additionally, the user may observe the results of his efforts immediately, making modification and remodification easier.

